REMARKS

Claims 26 and 34 have been amended. No claims have been added or canceled. Accordingly, after entry of this Amendment, claims 1-36 will remain pending.

In the Office Action dated July 22, 2005, the Examiner rejected claims 1, 2, 10-14, and 34 under 35 U.S.C. § 102(b) as being anticipated by Kagatsume et al. (U.S. Patent No. 4,908,095). Claims 7, 15-17, 35, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kagatsume et al. In addition, the Examiner rejected claims 7 and 20-25 under 35 U.S.C. § 103(a) as unpatentable over Kagatsume et al. in view of Rossman et al. (U.S. Patent No. 6,077,357). Next, claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kagatsume et al. in view of Wang et al. (U.S. Patent No. 6,537,011). The Examiner also rejected claims 3-6, 18, 19, and 26-33 under 35 U.S.C. § 103(a) as unpatentable over Kagatsume et al. in view of Rossman et al. and Liu (U.S. Patent No. 6,776,170).[1] The Applicant respectfully disagrees with these rejections and, therefore, respectfully traverses the same.

In response to the rejection of the claims, the Applicant respectfully submits that Kagatsume et al. does not describe, among other things, a vertically translatable chuck assembly for supporting a workpiece at different locations within a plasma reactor chamber, at least one support arm extending outwardly from the perimeter of the chuck base to sidewalls to support the chuck base within the interior region, a workpiece support member arranged above the chuck base upper surface, and one or more vertical translation members arranged between and operatively connecting the chuck base and the workpiece support member for supporting and vertically translating the workpiece support member relative to the chuck base. As a result, the Applicant respectfully submits that Kagatsume et al. cannot be relied upon either alone or in combination with other references to reject any of claims 1-28 and 35-36.

[1] In the Office Action, the Examiner listed Barnes et al. as the patent with which this rejection is fashioned. However, U.S. Patent No. 6,776,170 is issued to Liu. Moreover, there is not patent issued to Barnes et al. that is currently of record. Accordingly, the Applicant respectfully responds to the rejection based on Liu.

As a preliminary matter in connection with Kagatsume et al., the Applicant respectfully points out that Fig. 3 illustrates a robot 9 disposed within a carrier section 300. (Kagatsume et al. at col. 3, lines 23-26.) The robot 9 carries wafers W from a housing section 200 to an alignment section 400 as well as from a process section 500 to a housing section 200. (Kagatsume et al. at col. 3, lines 23-26.) The layout of these sections, including the robot 9, is illustrated in Fig. 2. Since the robot 9 is disposed outside of the process chamber 12, the Applicant respectfully submits that Kagatsume et al. is not properly asserted as a base reference to reject the claims.

The Examiner also relied on the "at least one support arm 10 and 72" in support of his rejection of the claims. The Applicant respectfully submits that reliance on these structures appears unjustified. First, the arm 10 is a part of the robot 9. (Kagatsume et al. at col. 3, lines 23-40.) Second, the multi-join arm 72 is a part of the handling device 70 disposed in the load lock chamber 13. (Kagatsume et al. at col. 4, lines 31-46.) As pointed out above, and as Figs. 2 and 4 illustrate, the robot 9, the handling device 70 and the handling device 80 for that matter, are all disposed outside of the process chamber 12.

In addition, the Applicant respectfully submits that Kagatsume et al. cannot be relied upon to reject the claims for other reasons. Kagatsume et al. describes an etching device with a process chamber, the details of which are provided at least in Fig. 5. As described, the process chamber 12 includes a lower electrode 20, a lifter 19 for moving the lower electrode 20 up and down, and an upper electrode 40. (Kagatsume et al. at col. 5, lines 5-13.) The lower electrode 20 may be moved up and down within the process chamber 12. (Kagatsume et al. at col. 5, lines 19-21.) In addition, the lifter 19 is located under the process chamber 12 and is connected to the lower electrode 20 to move it up and down. (Kagatsume et al. at col. 5, lines 33-35.) To do this, the lifter 19 includes a motor 24 for moving the lower electrode 20 up and down, a disk-like support 90 fixed to the bottom of the process chamber 12 that supports the motor 24, and three ball screws 23 connecting the support 90 to the bottom of the process chamber 12. (Kagatsume et al. at col. 5, lines 33-40.) Nuts screwed onto the ball screws 23 are fixed to the support plate 21. (Kagatsume et al. at col. 5, lines 33-40.) When the motor 24 is driven, the ball screw 23 connected to the motor 24 is rotated to move the lower electrode 20 up and down. (Kagatsume et al. at col. 5, lines 40-43.) Lower electrode

20 and the bottom of the process chamber 12 are connected by a bellow 27 made of stainless steel to keep the process chamber 12 vacuum tight. (Kagatsume et al. at col. 5, lines 52-57.)

As the foregoing makes abundantly clear, and as noted above, Kagatsume et al. does not describe or suggest, among other things, a vertically translatable chuck assembly for supporting a workpiece at different locations within a plasma reactor chamber, at least one support arm extending outwardly from the perimeter of the chuck base to sidewalls to support the chuck base within the interior region, a workpiece support member arranged above the chuck base upper surface, and one or more vertical translation members arranged between and operatively connecting the chuck base and the workpiece support member for supporting and vertically translating the workpiece support member relative to the chuck base. At a minimum, there is no support arm extending outwardly from the perimeter of the chuck base to sidewalls nor are there any vertical translation members operatively connecting the chuck base and the workpiece support member for supporting and vertically translating the workpiece support member relative to the chuck base. As a result, the Applicant respectfully submits Kagatsume et al. cannot be relied upon alone or in combination with other references combined to anticipate or render obvious claims 1-28 and 35-36.

The Applicant respectfully submits that Rossman et al. cannot be combined with Kagatsume et al. to render obvious any of claims 1-28 and 35-36 because Rossman et al. fails to cure the deficiencies noted above with respect to Kagatsume et al. Rossman et al. describes an orientless wafer processing of an electrostatic chuck. The dome 32 includes a temperature control assembly 64 which is illustrated in an exploded view in Fig. 4. (Rossman et al. at col. 6, lines 44-48.) The temperature control assembly, therefore, is located above the process area. The temperature control assembly 64 includes a cooling plate 82 with outwardly-extending arms, the details of which are not discussed in Rossman et al. Nowhere, however, is there any discussion of at least one support arm extending outwardly from the perimeter of the chuck base to sidewalls to support the chuck base within the interior region, a workpiece support member arranged above the chuck base upper surface, and one or more vertical translation members arranged between and operatively connecting the chuck base and the workpiece support member for supporting and vertically translating the workpiece support member relative to the chuck base. Accordingly, the Applicant

respectfully submits that Rossman et al. cannot be relied upon in combination with Kagatsume et al. to render obvious any of claims 1-28 and 35-36.

In addition, the Applicant respectfully submits that Wang et al. does not assist the Examiner with a rejection of the claims. Wang et al. describes a method and apparatus for transferring and supporting a substrate. Specifically, Wang et al. describes aspects of a substrate member 100 with a support ring 120 having one or more support members 204 mounted thereon. (Wang et al. at col. 4, lines 28-31.) Wang et al. also describes a substrate handler blade 300, which is illustrated in Figs. 8 and 18. (Wang et al. at col. 4, lines 28-41.) The substrate handler blade 300 is located in a loadlock 416. (Wang et al. at col. 8, lines 5-25.) The loadlock 416 is outside of the processing chamber 412. (Wang et al. at col. 10, lines 15-38.) No where does Wang et al. discuss or suggest a workpiece support member arranged above the chuck base upper surface, and one or more vertical translation members arranged between and operatively connecting the chuck base and the workpiece support member for supporting and vertically translating the workpiece support member relative to the chuck base. Accordingly, the Applicant respectfully submits that Wang et al. cannot be relied upon in combination with Kagatsume et al. to render obvious any of claims 1-28 and 35-36.

Each of the rejections concerning claims 1-28 and 35-36 having been addressed, the Applicant respectfully requests that the Examiner reconsider the rejection of claims 1-28 and 35-26, withdraw the rejections, and pass this application quickly to issuance.

Claims 29-33 are patentably distinguishable over the references cited by the Examiner because they recite, among other things, a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. None of the references relied upon by the Examiner describe or suggest such a combination of features. As a result, the Applicant respectfully submits that none of the references may be relied upon to render claims 29-33 obvious.

Kagatsume et al. describes an etching method, which is described in connection with Fig. 10. (Kagatsume et al. at col. 7, lines 43-45.) While a reaction gas is being supplied, a high-frequency current with a frequency of 13.56 MHz is applied from a high frequency power source 47. (Kagatsume et al. at col. 8, line 65, through col. 9, line 3.) There is, however, no discussion at least of a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Kagatsume et al. is insufficient to act as a base upon which a rejection of claims 29-33 may be fashioned.

The Applicant respectfully submits that Rossman et al. does not cure the deficiencies noted with respect to Kagatsume et al. Rossman et al. describes an orientless wafer processing on an electrostatic chuck with one of three separate RF match configurations illustrated in Figs. 2(a)-2(c). (Rossman et al. at col. 6, lines 14-15.) The match configurations are for use with a coil L, such as the top coil 72 and the side coil 74. (Rossman et al. at col. 6, lines 14-30.) Nowhere does Rossman et al. describe or suggest a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Rossman et al. cannot be combined properly with Kagatsume et al. to reject claims 29-33.

Liu also does not cure the deficiencies noted with respect to Kagatsume et al. Liu describes a method and apparatus for plasma cleaning of workpieces. According to Liu, a plasma cleaning system 12 includes a cleaning chamber 20. (Liu at col. 3, lines 13-17.) There is, however, no discussion of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the

impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Liu cannot be combined properly with Kagatsume et al. to reject claims 29-33.

Claim 34 is patentably distinguishable over Kagatsume et al. because claim 34 describes a method of providing for uniform, substantially axially symmetric flow of plasma gas over a workpiece in a plasma reactor chamber having a central axis and capable of containing a plasma in an upper interior region of the chamber. The method includes, among other features, supporting a chuck assembly within the reactor chamber with a plurality of support arms such that gas can flow around the chuck assembly, past the plurality of support arms, from the upper interior region. Kagatsume et al. does not describe such combination including a least this feature. Accordingly, the Applicant respectfully submits that Kagatsume et al. cannot anticipate claim 34.

Kagatsume et al. is discussed above. Accordingly, further discussion of Kagatsume et al. is not provided here. The Applicant notes, however, that Kagatsume et al. does not describe a method of providing for uniform, substantially axially symmetric flow of plasma gas over a workpiece in a plasma reactor chamber having a central axis and capable of containing a plasma in an upper interior region of the chamber including, among other features, supporting a chuck assembly within the reactor chamber with a plurality of support arms such that gas can flow around the chuck assembly, past the plurality of support arms, from the upper interior region. As a result, the Applicant respectfully submits that Kagatsume et al. cannot anticipate claim 34.

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Each of the rejections having been addressed, the Applicant respectfully requests that the Examiner withdraw the rejections of the claims and pass this application quickly to issuance. Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
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